

UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE
Forest Insect and Disease Management
P. O. Box 5895, Asheville, NC 28813

Report No. 80-1-18

3400

March 5, 1980



Mr. Hal Rector
Superintendent
Kennesaw Nat'l Battlefield Park GA,
Box 1167
Marietta, Georgia 30061

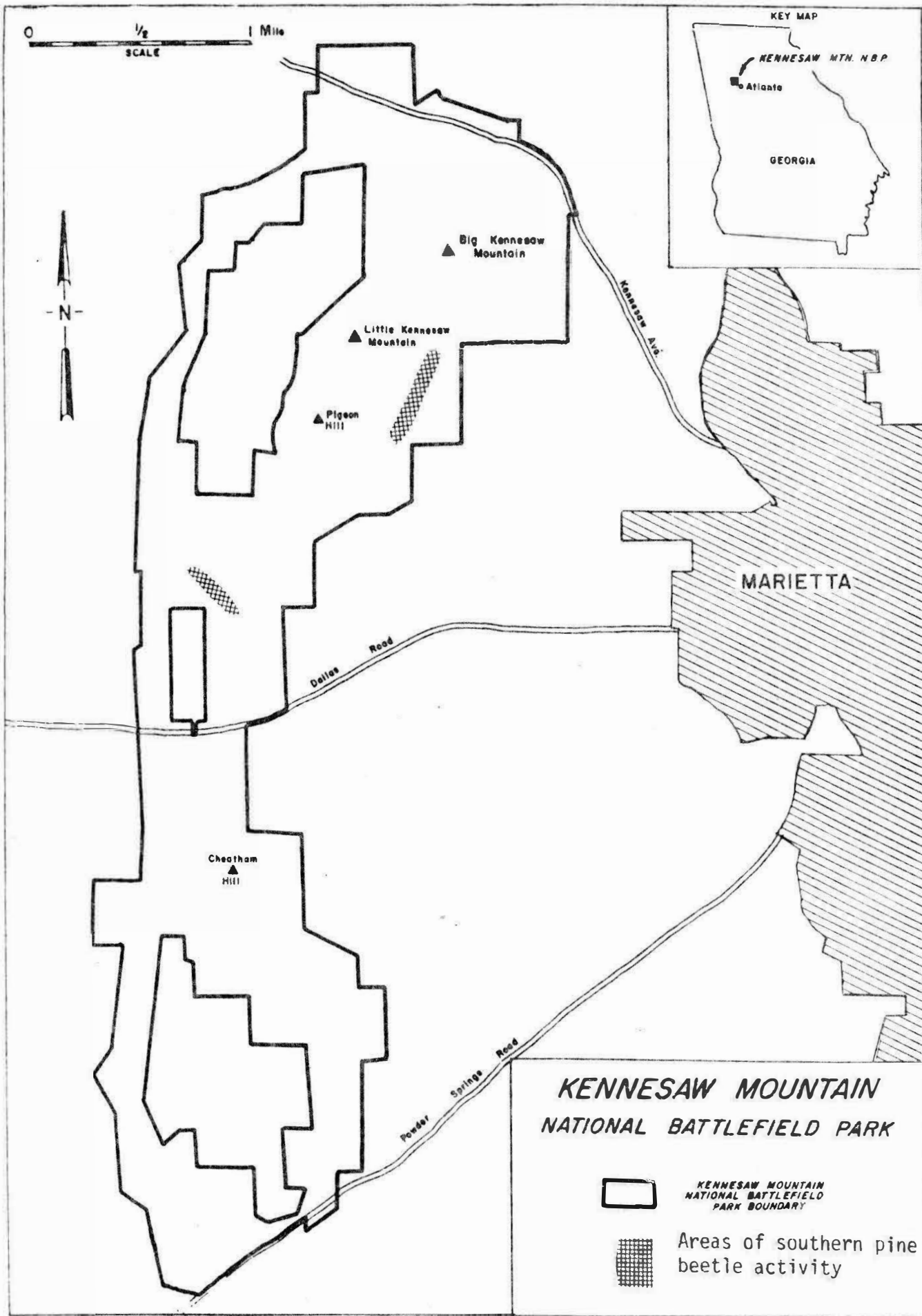
Dear Mr. Rector:

December 1979, our Aerial Survey Team at Doraville, Georgia, conducted an aerial sketch map survey of the 3,600 acre Kennesaw Mountain National Battlefield Park to detect possible forest insect and disease activity (Bassett, Robert, 1979. Aerial Detection Survey of Forest Insect and Disease Activity - Kennesaw Mountain National Battlefield Park. USDA Forest Service, SA, S&PF, FIDM Report No. 80-3-4). Four spots totaling 15, 30, 30 and 5 dead or dying trees were plotted on the map. On January 10, an entomologist from our office ground checked two of these spots as well as an additional spot of 10 trees which was not detected by air. In all three cases, the trees were killed by southern pine beetle. Half of all the trees at each infestation checked contained healthy southern pine beetle brood. There were 15 infested trees in the 30-tree spot, 8 trees infested in the 15-tree spot and 5 trees infested in the 10-tree spot. The enclosed map shows the areas where these infestations are concentrated.

The current infestations contain a high enough number of active trees and healthy brood to cause further losses this spring and summer.

The infestations on the park and surrounding private land are part of a Southwide outbreak extending from Mississippi to North Carolina and Virginia. Some of the heaviest losses are occurring on the Oconee National Forest in central Georgia, southeast of Marietta.

Data collected during this survey and ground examinations indicate that some type of suppression measures should be conducted to suppress the current infestations on the park. Our understanding is that the Park Service does not want to salvage these infested trees in each spot through commercial sales or conduct chemical control. Therefore, we recommend the use of piling and burning or the cut-and-leave control tactic. However, we can only recommend the cut-and-leave procedure during the months of June through October.



The following four suppression techniques are the current recommendations for southern pine beetle suppression on forested areas. The procedures are listed in the order of their effectiveness.

1. Removal of Infested Trees by Commercial Sale or Administrative Use. When infested trees of merchantable size are accessible, they should be removed by commercial sale or administrative use procedures. Logging of the infested material should begin immediately. Contract time limits should insure rapid removal.

When practical, and if host type is present, a 40- to 70-foot buffer strip should be marked and cut adjacent to and ahead of the most recently infested trees. This practice is effective in reducing the possibility of "breakouts." When only a small volume of infested merchantable material occurs in a spot, noninfested trees surrounding the spot may be marked to provide an operable cut.

The order of priority for removing beetle infested timber from a spot should be as follows:

- Trees in the buffer zone at the head(s) of the spot - if not removed within 2 weeks of marking, another visit and tally must be made in order to insure removal of all infested trees and an adequate buffer strip.
- Trees with fresh attacks and having young broods (usually the green, recently infested trees).
- Trees having nearly developed broods (usually the red and fading trees).

2. Piling and Burning. Unmerchantable or inaccessible southern pine beetle infestations can be suppressed by cutting, piling, and thoroughly burning the bark of infested trees. The entire bark surface must be thoroughly burned to insure effective control. The side order of priority for cutting, piling, and burning infested trees, particularly the large spots, is the same as paragraph 1 under "Removal of Infested Trees by Commercial Sale or Administrative Use." Cutting a buffer strip is not recommended. To reduce the possibility of "breakouts," every effort should be made to locate and treat all green infested trees during the piling and burning operation.
3. Chemical Control. Chemical formulation recommended for southern pine beetle control is a ½ percent lindane spray with No. 2 fuel oil as the carrier. This may be formulated from a 20 percent lin-

dane emulsifiable concentrate or oil concentrate at the rate of 11 pints of concentrate in enough fuel oil to make 55 gallons of spray. (Ratio of one part 20 percent lindane EC to 39 parts No. 2 diesel fuel.)

Cut, limb, and buck all infested trees into workable lengths. Spray the infested bark surface to the point of runoff. A compressed air sprayer (3-gallon capacity or equivalent) is an ideal applicator. Infested logs must be turned two or three times to insure complete treatment of infested bark. Low pressure sprayers may be used to treat large accessible infestations.

The order of priority for cutting and spraying infested trees in large spots is the same as paragraph 1 under "Removal of Infested Trees by Commercial Sale or Administrative Use." Cutting a buffer strip is not recommended. To reduce the possibility of "breakouts," every effort should be made to locate and treat all green infested trees during the chemical control operation.

Never spray trees from which southern pine beetle brood has emerged. Natural enemies of the southern pine beetle in these trees can then complete their development. To prevent aerial spotters from mapping treated spots, cut trees with red needles from which beetle have emerged.

Instructions for minimizing the adverse effects of mixing, transporting and storing pesticides, applying pesticides and disposing of pesticide containers and excess chemicals are outlined in Section 8.3 of the Forest Service Health and Safety Code FSM 5242.21. If this is not covered in the Park Service Health and Safety Codes, please contact us for these procedures.

4. Cut-and-leave. This control tactic reduced losses from spot growth and proliferation during the summer months. Cut-and-leave is designed to disrupt spot growth in small to medium-sized spots (40 active trees) by dispersing emerging beetles. These spots can be salvaged when markets or weather permit. Trees are still suitable for sale months after felling.

The following procedure is to be followed when cut-and-leave is used:

- (1) Identify all active trees within the spot.
- (2) Fell all active trees toward the center of the spot.
- (3) Fell a horseshoe-shaped buffer of green, uninfested trees around the most recently attacked trees at the head of the spot and leave them lying on the ground with crowns pointed toward the center of the spot. The buffer should be as wide as the average height of the trees in the stand.

Cut-and-leave treatments should only be applied during the summer months between June and October. Spots with 10 or more infested trees should be treated first. As time permits, spots with 10 infested trees should also be treated if they contain trees with recent, fresh attacks. In these smaller infestations where a specific head is not distinguishable, an adequate buffer strip (equivalent to the average height of the stand) and all infested and green uninfested trees within the spot should be felled.

Reexamination of Treated Areas. Reexamine areas where infested trees were removed by commercial sales, piled and burned, or chemically treated or cut and left within 2 or 3 weeks after treatment to check for additional infested trees. If additional trees are found, treat them.

In any area where infested trees are cut for chemical control or piling and burning or removed through commercial sales and administrative use procedures, stumps adjacent to living pine trees should be treated to control or prevent the root rot Fomes annosus.

Stands that have been previously thinned or have had a history of F. annosus infection, stumps should be treated with the competing fungus, Peniophora gigantea.

Southern pine beetle infested tree stumps cut during the period of May through August, and below 34° N. latitude do not have to be treated. This is because few spores are formed during this period and high temperatures often kill spores that are produced. However, routine summer thinning in areas of southern pine beetle buildup is not recommended (Froelich, R. C., et al., 1977).

The preceding techniques represent only short-term, immediate control strategies. In the long term, preventive measures must be taken to help ward off further southern pine beetle infestations in noninfested stands. Some of the more significant preventive measures include:

- (a) Preventing or minimizing littleleaf disease, a condition which predisposes these weakened trees to beetle attack. Depending on severity of infection, diseased trees may be removed during normal thinnings, on a 6-year cutting cycle or as soon as merchantable. In high-hazard areas or in replanting known littleleaf sites, use loblolly pine or a more resistant tree species, as opposed to shortleaf pine.
- (b) Harvesting mature and overmature stands. Such stands are vulnerable to beetle attack and should be harvested as soon as possible.
- (c) Thinning stagnated stands. Overstocked stands are low in vigor and are more likely to be attacked. They should be thinned to a point that trees again show thrift and vigor.

- (d) Minimizing impact of natural disturbances which cause stand stress. These factors include ice, wind, hail, and animal damage, flooding, erosion, poor soil fertility, etc. Corrective measures include removal of individually damaged trees, wholesale salvage, improving drainage, fertilization, etc.
- (e) Minimizing or eliminating man-caused disturbances. Logging, pipeline, sewerline, and powerline construction, and other construction activities require use of heavy equipment which causes tree skinning and soil compaction, and significantly weakens trees. Efforts to minimize the damaging consequences of these activities can significantly reduce the possibility of their leading to southern pine beetle problems.

All personnel should be informed of the problem and instructed to maintain constant surveillance for southern pine beetle activity. All sightings should be reported to the control project foreman.

PRECAUTIONARY PESTICIDE USE STATEMENT

Pesticides used improperly can be injurious to man, animals, and plants. Follow the directions and heed all precautions on the labels.

Store pesticides in original containers under lock and key--out of reach of children and animals--away from food and feed.

Apply pesticides so that they do not endanger humans, livestock, crops, and beneficial insects, fish, and wildlife. Do not apply pesticides when there is danger of drift, when honey bees or other pollinating insects are visiting plants, or in ways that may contaminate water or leave illegal residues.

Avoid prolonged inhalation of pesticide sprays or dusts; wear protective clothing and

If your hands become contaminated with a pesticide, do not eat or drink until you have washed. In case a pesticide is swallowed or gets in the eyes, follow the first aid treatment given on the label, and get prompt medical attention. If a pesticide is spilled on your skin or clothing, remove clothing immediately and wash skin thoroughly.

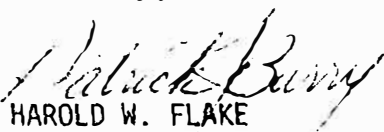
Do not clean spray equipment or dump excess spray material near ponds, streams, or wells. Because it is difficult to remove all traces of herbicide from equipment, do not use the same equipment for insecticides or fungicides that you used for herbicides.

Dispose of empty pesticide containers promptly. Have them buried at a sanitary landfill dump, or crush and bury them in a level, isolated place.

NOTE: Some states have restrictions on the use of certain pesticides. Check your state and local regulations. Also, because registrations of pesticides are under constant review by the U.S. Department of Agriculture, consult your county agricultural agent or state extension specialist to be sure the intended use is still registered.

You will also find enclosed some literature on southern pine beetle identification and biology. If we can be of further assistance, please let us know.

Sincerely,

A handwritten signature in cursive script, appearing to read "Harold W. Flake".

HAROLD W. FLAKE
Field Office Representative

Enclosure